

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Rana yavapaiensis*
COMMON NAME: Lowland Leopard Frog
SYNONYMS: *Rana pipiens* complex
FAMILY: Anura: Ranidae

AUTHOR, PLACE OF PUBLICATION: Platz and Frost, 1984. Copeia, 1984:940-948.

TYPE LOCALITY: Elevation 671 m (2200 ft) Tule Creek, Yavapai Co. Arizona.

TYPE SPECIMEN: 117632 American Museum of Natural History. J.E. Platz, 25 August 1971.

TAXONOMIC UNIQUENESS: *Rana* is a large genus, including Old and New World species (Stebbins 1985). The *Rana pipiens* complex was recently separated and contains nearly 30 species in North America and 7 species within Arizona (6 native and 1 introduced) (Hillis 1988). Distinguishing these 7 leopard frogs in Arizona has been problematic because they are recently described, similar in appearance, and can inhabit the same locality (Platz and Platz 1973; Platz 1984; Jennings 1988; Jaeger et al. 2001).

DESCRIPTION: "A species of the *Rana pipiens* complex with an adult snout-vent length (SVL) of 46-87 mm (1.8-3.4 in; males 46-72 mm (1.8-2.8 in); females 53-87 mm (2.1-3.4 in)). Dorsolateral folds are present and prominent, lighter in color than the dorsum, interrupted posteriorly and deflected medially in the sacral region. The supralabial stripe is incomplete (diffuse anterior to the eye). The venter is cream in color. Yellow pigmentation on the groin often extends onto the posterior venter and underside of the legs" (Platz 1988).

AIDS TO IDENTIFICATION: *Rana yavapaiensis* can be distinguished from the 6 other species of leopard frogs within its range. "*Rana blairi* has a complete supralabial stripe extending anteriorly to the tip of the snout. *Rana pipiens* has a complete supralabial stripe, complete dorsolateral folds uninterrupted and undeflected in the sacral region. Adult *R. pipiens* may have green pigment in the groin region and males possess vestigial oviducts. The posterior surfaces of the thighs in *R. chiricahuensis* have numerous small papilla, each surrounded by cream colored skin. Adult *R. chiricahuensis* have a mottled venter, and males along the southern Arizona border have vestigial oviducts. *R. berlandieri* is native to New Mexico and was unintentionally introduced in recent years to southwestern Arizona. Males, unlike *R. yavapaiensis*, possess prominent vestigial oviducts" (Platz 1988). *R. yavapaiensis* is most similar genetically to *R. onca* (Jaeger et al. 2001), and adult *R. onca* have "incomplete, indistinct, dorsolateral folds extending 1/2 to 3/4 of the way down the dorsum, ... shortened legs, an incomplete supralabial stripe, and upper surfaces of the thighs usually spotted rather than barred" (Jennings 1988).

ILLUSTRATIONS: Color drawing (Stebbins 1985: plate 15)

TOTAL RANGE: The range of *R. yavapaiensis* historically extended throughout low elevation sites in the drainage of the lower Colorado River and its tributaries in Nevada, California, Arizona, New Mexico, northern Sonora and extreme northeast Baja California, Mexico (Vitt and Ohmart 1978; Clarkson and Rorabaugh 1989; Jennings and Scott 1991; Jennings and Hayes 1994a, Sredl et al. 1997b). *R. yavapaiensis* is probably extirpated from California (Vitt and Ohmart 1978) and possibly extirpated from all but Hildago County in New Mexico (Scott 1992; Jennings 1995; Christman and Painter, unpublished data). Populations in Nevada are now thought to be *R. onca* (Jaeger et al. 2001).

RANGE WITHIN ARIZONA: Colorado River near Yuma, west, central, and southeast Arizona, south of the Mogollon Rim.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Size at metamorphosis for *R. yavapaiensis* ranges from 25-29 mm (0.9-1.2 in) SVL (Platz 1988). The smallest males to exhibit secondary sexual characteristics from study sites in Graham and Yavapai counties, Arizona were 53.5 mm (2.1 in) and 56.2 mm (2.2 in) SVL, respectively (Sredl unpublished data). Size at which females reach sexual maturity is not known. Females have a mean asymptotic SVL of 76.4 mm (3.0 in), while that of males is 63.1 mm (2.5 in) (Sredl et al. 1997a). Preliminarily, skeletochronology of *R. yavapaiensis* indicate that they can live as long as 3 years (Sredl and Fernandez unpublished data). Estimates of survivorship of the adult and juvenile stages appear to follow a seasonal pattern (Sredl et al. 1997a): high in the spring and summer and lower in the fall and winter. Within any given year, survivorships were always lowest in the winter. In 3 of 4 years for which there were estimates for all four intervals, wintertime survivorship was by far the lowest; this pattern held for both adults and juveniles. In populations examined, sex ratios generally do not differ from 1:1 (Sredl et al. 1997a).

REPRODUCTION: Egg masses have been observed from January through late April and October (Ruibal 1959; Collins and Lewis 1979; Frost and Platz 1983). Reproductive activity may decrease between the time temperatures warm in mid May and prior to the onset of the summer rains in early July (Sredl unpublished data). Male lowland leopard frogs attract a potential mate by emitting an airborne call consisting of a series of low pulses lasting 3-8 seconds (Platz and Frost 1984). Proximate cues that stimulate mating in *R. yavapaiensis* are not well studied, although rainfall and water temperature have been mentioned as cues for other leopard frog species in the Southwest. Hatching time has not been studied in *R. yavapaiensis*. Larvae metamorphose in 3-9 months and can overwinter (Collins and Lewis 1979; Sredl unpublished data). Altig et al. (1998) describes the tadpoles of *R. yavapaiensis*.

FOOD HABITS: Adults eat arthropods and other invertebrates (Stebbins 1985; Degenhardt et al. 1996). Larvae are herbivorous and likely eat algae, organic debris, plant tissue, and minute organisms in water (Marti and Fisher 1998). Stomach analyses of other members of the leopard frog complex from the western United States show a wide variety of prey items, including many types of aquatic and terrestrial invertebrates (e.g., snails, spiders, and insects) and vertebrates (e.g., fish, other anurans [including conspecifics], and small birds; Stebbins 1951).

HABITAT: *Rana yavapaiensis* inhabit aquatic systems in desert grasslands to pinyon-juniper (Platz and Frost 1984). They are habitat generalists and breed in a variety of natural and man-made aquatic systems. Natural systems include rivers, permanent streams, permanent pools in intermittent streams, beaver ponds, cienegas (=wetlands), and springs, while man-made systems include earthen cattle tanks, livestock drinkers, canals, irrigation sloughs, wells, mine adits, abandoned swimming pools, and ornamental backyard ponds (Platz and Frost 1984; Scott and Jennings 1985; Sredl and Saylor 1998). Most historical localities are small to medium-sized streams and rivers (Jennings 1987; Sredl and Saylor 1998). In lotic habitats, they are concentrated at springs, near debris piles, at heads of pools, and near deep pools associated with root masses (Jennings 1987; Sredl unpublished data).

The role of habitat heterogeneity within the aquatic and terrestrial environment is unknown, but likely important. Shallow water with emergent and perimeter vegetation provide basking habitat and deep water, root masses, undercut banks, and debris piles provide refuge from predators and potential hibernacula (Jennings 1987; Platz 1988; Jennings and Hayes 1994a; Sredl unpublished data). In semi-permanent aquatic systems, *R. yavapaiensis* may survive the loss of surface water by retreating into deep mud cracks, mammal burrows, or rock fissures (Howland et al. 1997). Seim and Sredl (1994) studied the association between juveniles and adult stages and pool size and found juveniles were more frequently associated with small pools and marshy areas while adults were more frequently associated with large pools.

ELEVATION: Elevation range in Arizona is 244-1678 m (800-5,500 ft) (Sredl et al. 1997b), but is from seas level to 1817 m (5,960 ft) range wide (Jennings and Hayes 1994b).

PLANT COMMUNITY: Lower and Upper Sonoran Desert, grassland, oak and oak-pine woodland (Stebbins 1985).

POPULATION TRENDS: Adequate data is needed to determine status of *Rana yavapaiensis* in central Arizona, but populations are thought to be stable (Sredl et al. 1997a). The species is declining in southeast Arizona and is extirpated from southwestern Arizona (USDI, FWS 1991; Sredl et al. 1997b).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]
[C2 USDI, FWS 1989]

STATE STATUS: WC (AGFD, WSCA in prep)
[State Candidate AGFD, TNW 1988]

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1988]
Determined Subject to Special Protection (Secretaría de Medio Ambiente 2000)
[Listed Rare, Secretaría de Desarrollo Social 1994]

MANAGEMENT FACTORS: *R. yavapaiensis* are negatively impacted by introduced bullfrogs, crayfish, and predatory fish (Rosen et al. 1995, Fernandez and Rosen 1996). A chytrid fungus has infected populations of *R. yavapaiensis* as well as six other ranid frogs and two other amphibians causing mass die-offs and local extirpations (Sredl et al. 2000). Habitat fragmentation and water manipulation can lead to local extirpation by disrupting the metapopulation dynamics of lowland leopard frogs in arid landscapes (Jennings and Scott 1991). Other prominent factors are water pollution and heavy grazing.

PROTECTIVE MEASURES TAKEN: *Rana yavapaiensis* is a closed season species. Collections of this species is illegal statewide without a scientific collecting or similar permit (Arizona Game and Fish Department 2001).

SUGGESTED PROJECTS: Studies on disease, population and metapopulations, dispersal abilities, habitat reservations, and effectiveness of translocations are needed.

LAND MANAGEMENT/OWNERSHIP: Forest Service (Coconino, Coronado, Prescott, and Tonto National Forests), Bureau of Land Management, Bureau of Indian Affairs, National Park Service, State, and Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

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